

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

COMARCO WIRELESS TECHNOLOGIES, INC.,
Patent Owner.

Case IPR2015-01879
Patent 8,492,933 B2

Before BRIAN J. McNAMARA, PATRICK M. BOUCHER, and
GARTH D. BAER, *Administrative Patent Judges*.

BAER, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

Apple Inc. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of claims 1 and 2 of U.S. Patent No. 8,492,933 B2 (Ex. 1001, “the ’933 patent”). Comarco Wireless Technologies, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 13. Pursuant to 35 U.S.C. § 314(a), we determined the Petition showed a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of claims 1 and 2 and instituted an *inter partes* review of those claims. Paper 15, 16. Patent Owner filed a Patent Owner Response (Paper 17, “PO Resp.”) and Petitioner filed a Reply to Patent Owner’s Response (Paper 18, “Reply”). An oral hearing was held before the Board. Paper 26.

We issue this Final Written Decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. Having considered the record before us, we determine Petitioner has shown by a preponderance of the evidence that claims 1 and 2 of the ’933 patent are unpatentable. *See* 35 U.S.C. § 316(e).

II. BACKGROUND

A. RELATED PROCEEDINGS

The parties assert the ’933 patent is involved in *Comarco Wireless Technologies, Inc. v. Apple Inc.*, Case No. 8:15-cv-00145-AG, currently pending in the United States District Court for the Central District of California. Pet. 2; Paper 5, 1.

B. THE ’933 PATENT

The ’933 patent is directed to power supply equipment for electronic devices. Ex. 1001, Abstract. Figure 3 of the ’933 patent is reproduced below:

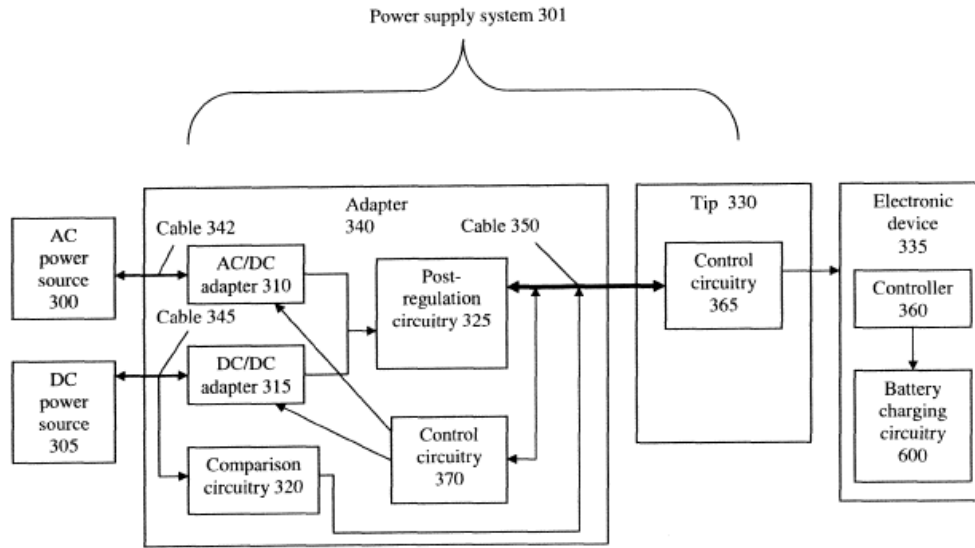


FIG. 3

Figure 3 depicts a power supply system for use with either AC or DC power source 300 or 305, which is connected to adapter 340, which is then connected via cable 350 to tip 330, which provides power to electronic device 335. *Id.* at 3:37–57, 4:19–54. According to the '933 patent, circuitry in adapter 340 may output a signal based on information about the power source, and that signal may be sent via cable 350 to tip 330 and then on to electronic device 335. *Id.* at 4:43–54. Based on the signal, the electronic device 335 may control the amount of power drawn to prevent overheating. *Id.* at 3:26–28, 4:54–63. The '933 patent explains also that tips “may be removable from the cable 350” and “may have different shapes and sizes, depending [on] the shape and sizes of the power input openings of the respective electronic devices 335 being powered.” *Id.* at 3:55–60.

C. CHALLENGED CLAIMS

Challenged claims 1 and 2 of the '933 patent recite as follows:

1. Power supply equipment comprising:

an adapter to convert power from a power source, external to the adapter, to DC power for powering an electronic device, the adapter including circuitry for producing an analog data signal for use by the electronic device to control an amount of power drawn by the electronic device; and

a cable having proximal and distal ends, the proximal end being electrically coupled to the adapter and the distal end terminating in an output connector, the output connector including:

a plurality of conductors to transfer the DC power and the analog data signal to the electronic device; and

circuitry to receive a data request from the electronic device and in response transmit a data output to the electronic device to identify the power supply equipment to the electronic device.

2. The power supply equipment of claim 1 wherein the output connector can be detached from the cable.

Ex. 1001, 10:34–52.

D. INSTITUTED GROUNDS OF UNPATENTABILITY

We instituted *inter partes* review of claims 1 and 2 to determine whether they are unpatentable under 35 U.S.C. § 103(a) over the combined teachings of U.S. Patent No. 7,243,246 B2 (issued July 10, 2007) (Ex. 1003, “Allen”), U.S. Patent No. 7,296,164 B2 (issued Nov. 13, 2007) (Ex. 1004, “Breen”), and U.S. Patent No. 6,054,846 (issued Apr. 25, 2000) (Ex. 1005, “Castleman”). Inst. Dec. 16.

III. ANALYSIS

A. PRINCIPLES OF LAW

Petitioner bears the burden of proving unpatentability of the challenged claims, and that burden never shifts to Patent Owner. *Dynamic*

Drinkware, LLC v. Nat'l Graphics, Inc., 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail, Petitioner must establish the facts supporting its challenge by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d).

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time of the invention. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). Obviousness is resolved based on underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. CLAIM CONSTRUCTION

We conclude that no express claim construction is necessary to resolve whether Petitioner has demonstrated claims 1 and 2 of the '933 patent are unpatentable. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”).

C. ASSERTED PRIOR ART

1. *Allen (Ex. 1003)*

Allen discloses power supply equipment for managing power to an electronic device. Ex. 1003, Abstract, 1:10–18. Allen's Figure 4 is reproduced below:

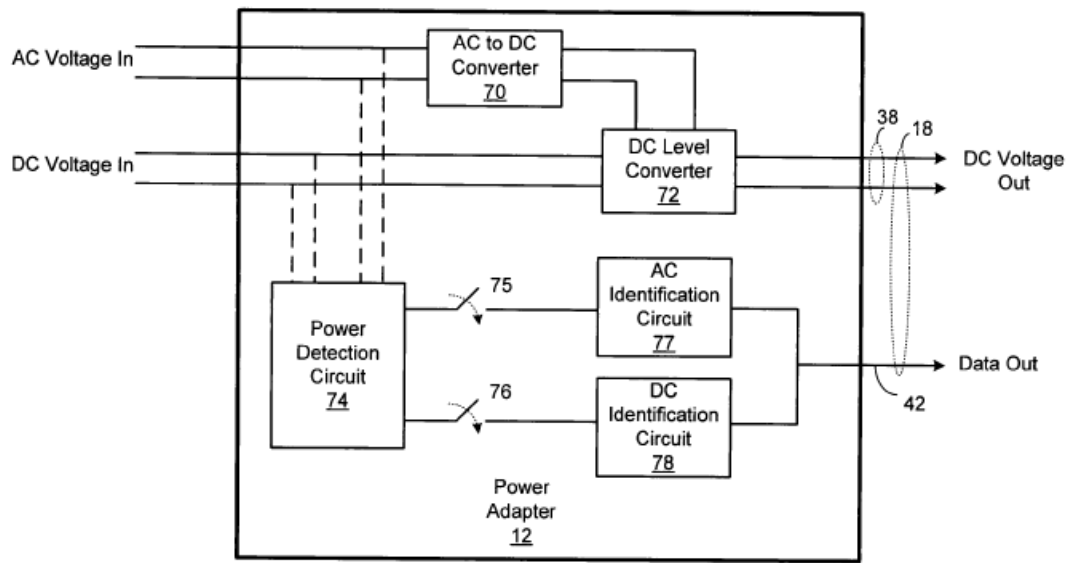


Figure 4

Figure 4 is a block diagram of the system components in Allen’s power adapter. *Id.* at 5:6–7. Allen describes that the power adapter includes “[a] power detection circuit . . . operable to detect whether the power source is AC or DC.” *Id.* at 5:17–18. The power detection circuit transmits the information via a data signal to the electronic device’s power management components, which then use the information to “implement various power management functions.” *Id.* at 5:21–34.

2. Breen (Ex. 1004)

Breen discloses power supply equipment for managing power supplied to an electrical device—what Breen refers to as an “Information Handling System” or “IHS”—such as a notebook computer or cellular phone. Ex. 1004, 1:6–19, 4:13–15. Breen’s “power supply system includes one or more power peripherals, devices or components, which are interconnected in an arrangement to provide power to a load device such as the portable IHS device.” *Id.* at 4:15–19 (reference numerals omitted). Breen

describes that some power peripherals may “receive and convert power from one form or type to another,” while others “may pass through a signal received as an input to generate an output signal, which is substantially the same as the input signal.” *Id.* at 4:19–25. Breen discloses further “a power supply identification (PSID) scheme to identify the various types of power supply sources present.” *Id.* at 5:1–3. Particularly relevant to this case, Breen explains that “to determine its power source and optimize its performance, a controller included within the portable IHS device sends a request signal to one or more power peripherals over a bi-directional PSID line to request PSID information. Each power peripheral, which is queried, sends a response signal over the PSID line.” *Id.* at 5:31–37 (reference numerals omitted). Breen notes “[i]n one embodiment, the PSID may be a certain current or voltage level present on a sense line.” *Id.* at 6:2–4

3. Castleman (Ex. 1005)

Castleman teaches a single power supply for multiple electronic devices with different power requirements. Ex. 1005, 4:44–50. Information about an individual electronic device is encoded in a memory chip associated with that device, and is provided to the power supply when the electronic device is connected to the power supply. *Id.* at 4:60–65. The power supply “accepts and analyzes information from the individual-device memory chips,” and controls the power supply to provide power to the electronic device at the appropriate level. *Id.* at 4:51–5:2. Particularly important to this case, Castleman includes an embodiment in which an output connector of a cable that plugs into an electronic device contains the memory chip that identifies the individual electronic device to the power supply. *Id.* at 9:31–35, 16:58–68.

D. OBVIOUSNESS OF CLAIMS 1 AND 2 BASED ON ALLEN, BREEN, AND
CASTLEMAN

Petitioner asserts the challenged claims would have been obvious over Allen in combination with Breen and Castleman. Pet. 30–41. Patent Owner responds, arguing the combination of Allen and Breen fails to teach “the adapter including circuitry for producing an analog data signal for use by the electronic device to control an amount of power drawn by the electronic device,” as claims 1 and 2 require. PO Resp. 15–23. Patent Owner challenges also Petitioner’s proffered reason for combining Allen’s, Breen’s, and Castleman’s teachings. *Id.* at 24–33. Based on our review of the arguments and evidence in the Petition, Response, and Reply, we determine Petitioner has demonstrated, by a preponderance of evidence, the subject matter of claims 1 and 2 would have been obvious over Allen, Breen, and Castleman, as explained below.

1. *The Combination of Allen and Breen Teaches the Disputed Limitation “the adapter including circuitry for producing an analog data signal for use by the electronic device to control an amount of power drawn by the electronic device”*

Claim 1 (and, by dependence, claim 2) requires “the adapter including circuitry for producing an analog data signal for use by the electronic device to control an amount of power drawn by the electronic device.” We agree with Petitioner that the combination of Allen and Breen teaches this limitation. *See* Pet. 16–18, 27, 33–34, 39–40. In particular, as Petitioner explains, Allen teaches an adapter with identification circuits that produce data signals, which are transmitted to an electronic device. Pet. 16 (citing Ex. 1003, Fig. 4, 5:21–42). Allen teaches also that the electronic device uses those transmitted data signals “to implement various power management functions,” including “reduc[ing] the total power drawn by the device,

thereby controlling the amount of power drawn by the electronic device from the adapter.” *Id.* (citing Ex. 1003, Fig. 4, 5:21–42; Ex. 1010 ¶ 71). Although Allen does not teach explicitly that the outgoing signal from the adapter to the electronic device is analog, we agree with Petitioner that Breen discloses circuitry for producing an outgoing analog signal. Pet. 33–34. In particular, Breen teaches generating an analog power event signal that is “a pulse signal having a predetermined width,” Ex. 1004, 6:35–42, as well as an analog output signal transmitting PSID information through a “current or voltage level present on a sense line,” *id.* at 6:2–4. *See* Ex. 1010 ¶ 89.

Patent Owner raises two arguments in challenging whether the combination of Allen and Breen teaches the disputed limitation (i.e., “an adapter including circuitry for producing an analog data signal for use by the electronic device to control an amount of power drawn by the electronic device”). Patent Owner does not dispute that Breen teaches circuitry for producing an analog signal. *See* PO Resp. 22–26; Ex. 1021, 116:22–25. Instead, Patent Owner argues (1) Breen’s output signal is not generated by circuitry in an adapter and (2) Breen’s electronic device does not use the power event signal to control the amount of power drawn by the electronic device because that signal prompts another signal—a PSID request/response—that the electronic device uses to adjust power parameters and device performance. PO Resp. 23.

We disagree with Patent Owner’s first argument because, although Breen teaches an embodiment in which an external battery generates the power event signal, *see* Ex. 1004, 6:35–40, Breen teaches another embodiment without an external battery, in which the first power peripheral

(i.e. the power adapter) connects directly to the electronic device, *see id.* at 6:10–18. We agree with Petitioner that in Breen’s single power-peripheral embodiment, the power event is generated in the power adapter periphery, not the battery. *See* Pet. Reply 10–11; Ex. 1004, 5:53–65, 6:10–18. We disagree with Patent Owner’s second argument because it requires reading into claim 1 a limitation not present in the claim’s plain language—that only one signal (i.e., the PSID signal) can be used to control an amount of power drawn by the electronic device. *See* PO Resp. 23. Breen’s electronic device uses both the power event signal and PSID signal to control an amount of power drawn by the electronic device. As Petitioner explains, Breen’s power event trigger “is used by the IHS to change the amount of power drawn, because it triggers a query for PSID data, which is then used to change the power drawn.” Reply 11; *see* Pet. 33–34.

In addition, we are not persuaded by Patent Owner’s two arguments challenging Breen because even if Patent Owner were correct in its characterization of Breen, those arguments would not ultimately undermine obviousness because it is undisputed that Allen teaches both features Patent Owner alleges are missing from Breen: (1) an output signal that controls the amount of power drawn by an electric device and (2) an adapter that includes the circuitry for producing the output signal. *See* PO Resp. 15–22 (challenging only whether Allen’s signal is analog, not whether it is produced in a power adapter or used by the electronic device to control the amount of power drawn); *see also* Pet. 16; Ex. 1003, 5:21–42, Fig. 4; Ex. 1010 ¶ 71. In short, Patent Owner’s arguments are not persuasive because they attack Breen individually, rather than the combined teachings of Allen and Breen. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

For the reasons explained above, we find Petitioner has shown the combination of Allen and Breen teaches “the adapter including circuitry for producing an analog data signal for use by the electronic device to control an amount of power drawn by the electronic device,” as claims 1 and 2 require.

2. Undisputed Limitations

Petitioner contends the combination of Allen, Breen, and Castleman discloses the remaining, unchallenged limitations of claims 1 and 2. *See* Pet. 30–41. Patent Owner does not address the merits of Petitioner’s assertions regarding the asserted prior art’s disclosure of those limitations. *See* PO Resp. 15–33. We are persuaded by Petitioner’s assertions, as explained below.

a. Claim 1

Petitioner has shown Allen discloses “an adapter to convert power from a power source, external to the adapter, to DC power for powering an electronic device.” *See* Pet. 39; *see also id.* at 27 (citing Ex. 1003, 1:10–13, 2:24–33, 3:65–67, 4:1–3, 5:6–17, Figs. 3, 4; Ex. 1010 ¶ 70). Petitioner has shown Allen discloses “a cable having proximal and distal ends, the proximal end being electrically coupled to the adapter and the distal end terminating in an output connector.” *See* Pet. 34; *see also id.* at 28 (citing Ex. 1003, 3:20–22, 4:3–6, 4:11–13, Figs. 1, 3, 4; Ex. 1010 ¶¶ 73–74).

Petitioner has shown Allen discloses “the output connector including: a plurality of conductors to transfer the DC power and the analog data signal to the electronic device.” *See* Pet. 34; *see also id.* at 28 (citing Ex. 1003, 4:3–6, 4:11–13, Figs. 3, 4; Ex. 1010 ¶ 75). Petitioner has shown also the combination of Allen, Breen, and Castleman teaches “the output connector including . . . circuitry to receive a data request from the electronic device

and in response transmit a data output to the electronic device to identify the power supply equipment to the electronic device” because Allen teaches the claimed identification circuitry (*see* Pet. 20–21 (citing Ex. 1003, 4:33–35, 5:21–51, 5:60–6:3; Ex. 1010 ¶ 77), 35–36), Breen teaches sending an identification signal in response to a data request (*see* Pet. 35 (citing Ex. 1004, 5:31–43; Ex. 1010 ¶ 93)), and Castleman teaches placing identification circuitry in an output connector at the distal end of an adapter’s cable (*see* Pet. 35–36 (citing Ex. 1005, Abstract, 3:54–6:27, 9:26–35, 10:1–11, 18:11–13, Figs. 1, 2; Ex. 1010 ¶ 94)).

b. Claim 2

Petitioner has shown Castleman discloses the additional limitation in dependent claim 2: “wherein the output connector can be detached from the cable.” *See* Pet. 38 (citing Ex. 1005, 8:15–18; Ex. 1010 ¶ 98).

3. Rationale for Combining Allen, Breen, and Castleman

As explained below, we find Petitioner articulated sufficient reasoning with some rational underpinning to support the legal conclusion that its proffered combination would have been obvious to one of ordinary skill in the art, as explained below. *See KSR*, 550 U.S. at 418.

i. Combining Allen and Breen

To the extent Allen does not teach request/response circuitry or producing an analog data signal, we find Petitioner explains not only how Breen teaches those features, but also why including them would have been obvious to one skilled in the art. *See* Pet. 36–38. Petitioner explains, with relevant support from its Declarant, that one skilled in the art would combine Breen’s request/response circuitry with Allen’s power supply equipment because “Breen offers a more efficient design choice—transmitting a signal

only in response to a request from the electronic device requires less power and creates less heat waste than transmitting a constant signal.” Pet. 37 (citing Ex. 1010 ¶ 96). Petitioner asserts also that Breen’s request/response circuitry was a known, predictable alternative to Allen’s identification circuitry because “both lead to the same, predictable result—whether triggered by a request by the electronic device or not, the power supply equipment sends the electronic device a signal that identifies the power supply equipment to the electronic device, which the electronic device can use to adjust power use settings.” Pet. 36–37 (citing Ex. 1010 ¶ 95). We agree with Petitioner that Breen’s request/response circuitry combined with Allen’s power supply equipment would provide a more power-efficient design over comparable circuitry that continuously broadcasts an identification signal. We agree further that Petitioner’s proposed combination amounts to an obvious combination of familiar elements (i.e., Allen’s power supply equipment and Breen’s request/response circuitry) according to known methods, yielding only the predictable result of identifying power supply equipment to facilitate controlling power use settings based on the identification. *See KSR*, 550 U.S. at 416.

Petitioner has sufficiently explained also why it would have been obvious to employ an *analog* output signal with Allen’s power supply equipment, in light of Breen’s disclosure of such analog signals. As Petitioner explains, “a person ordinary skill in the art would have had only two options in implementing the circuit illustrated in [Allen’s] Figure 4: an analog signal or a digital signal.” Pet. 17 (citing Ex. 1010 ¶ 72). Because, as Breen makes clear, analog identification signals were known, we agree with Petitioner that “[a] person of ordinary skill in the art would have

understood that either an analog signal or a digital signal can contain data for use by an electronic device in performing power management functions.” *See id.*; *see also KSR*, 550 U.S. at 402 (explaining that “[w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp”).

Patent Owner asserts one skilled in the art would not combine Breen and Allen because the resulting power savings are too small to motivate one skilled in the art to redesign Allen to include Breen’s request/response circuitry. PO Resp. 25–26. We disagree. First, “the test for obviousness is what the combined teachings of the references would have suggested to those having ordinary skill in the art,” not the logistics of physically redesigning one reference to include elements from another. *See In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012) (“a determination of obviousness based on teachings from multiple references does not require an actual physical substitution of elements”). So long as Breen’s request/response circuitry could improve efficiency, it is irrelevant whether that improvement would be enough to justify modifying a physical embodiment of Allen’s power supply equipment. In addition, even without power savings, the proffered combination would still be an obvious combination of familiar elements according to known methods that does no more than yield predictable results, as explained above. *See KSR*, 550 U.S. at 402.

ii. Combining Castleman with Allen, as Modified by Breen

Petitioner also has articulated sufficient reasoning with some rational underpinning to support the legal conclusion that it would have been obvious

to one of ordinary skill in the art to combine Castleman's teaching related to placing the identification circuitry in the output connector of the distal end of a power supply with Allen's power supply equipment, as modified by Breen. *See KSR*, 550 U.S. at 418. Petitioner explains, with relevant support from its Declarant and the prior art, that one skilled in the art would have been motivated to combine Castleman's circuit placement for cost benefits (i.e., avoiding an additional conductor along the length of the cable) and flexibility (i.e., "solving the 'multiple-power-supply problems' addressed in the patent."). Pet. 38 (citing Ex. 1005, 4:22–27, 10:3–6); *see also* Reply 17. Thus, we find one skilled in the art would have had reason to combine Castleman's teachings with Allen, as modified by Breen, in the manner advanced by Petitioner.

Patent Owner does not contest that placing a PSID chip in a cable's output connector (as taught in Castleman) has cost and flexibility benefits over housing it in the adapter itself (as taught in Breen and Allen). Instead, Patent Owner argues that one skilled in the art would not combine Castleman with Allen because "[i]n Allen and Breen . . . the PSID identification circuit or chip is already built into a circuit board in an adapter or peripheral battery" and "a person of ordinary skill would have no need or desire to incur the expense and complications of moving a PSID chip from an adapter or a battery to a cable output connector." PO Resp. 29–30. Patent Owner asserts also that applying Castleman's teaching to detachable cables would be problematic because PSID data could be mismatched with a power adapter it does not represent. *Id.* at 31–32.

We disagree with Patent Owner's first argument because it relates to the logistics of physically redesigning one reference to include elements

from the other, rather than looking to what the combined references' teachings would have suggested to one with ordinary skill in the art. *See Mouttet*, 686 F.3d at 1332. We disagree with Patent Owner's second argument because even if the proposed modification taught in Castleman introduces the potential for mismatched PSID data and power adapters for detachable cables, that tradeoff does not necessarily undermine Petitioner's proffered combination given Petitioner's articulated benefits, including reduced cost and increased flexibility. *See Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000) ("The fact that the motivating benefit comes at the expense of another benefit, however, should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another. Instead, the benefits, both lost and gained, should be weighed against one another.").

IV. CONCLUSION

For the reasons explained above, having considered the parties' contentions and supporting evidence, we determine Petitioner has shown by a preponderance of the evidence the subject matter of claims 1 and 2 would have been obvious over Allen, Breen, and Castleman and that those claims are therefore unpatentable under 35 U.S.C. § 103(a).

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has shown by a preponderance of the evidence that claims 1 and 2 of the '933 patent are unpatentable; and

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FURTHER ORDERED that, because this is a Final Written Decision, the parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

PETITIONER:

Xin-Yi Zhou
Cameron Westin
Scot Rives
O'MELVENY & MYERS LLP
vzhou@omm.com
cwestin@omm.com
srives@omm.com

PATENT OWNER:

Harris Wolin
GRAHAM CURTIN, PA
hwolin@grahamcurtin.com